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I, KAY WARD, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. PQ 1533 for a patent by ORICA AUSTRALIA PTY LTD filed on 09 July 1999.



WITNESS my hand this  
Twenty-fourth day of July 2000

*K Ward*

KAY WARD  
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**A U S T R A L I A**  
**Patents Act 1990**

**PROVISIONAL SPECIFICATION**  
for the invention entitled:

**"Primer Casing and Method of Charging a Blasthole"**

The invention is described in the following statement:

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### PRIMER CASING AND METHOD OF CHARGING A BLASTHOLE

The present invention relates to a primer casing and to a method of charging a blasthole. In particular, the present invention relates to a primer casing adapted to engage a blasthole wall and maintain the position of the primer within the blasthole. The primer casing permits improved loading of a blasthole by permitting the primers to be more accurately retained in position in the blasthole.

It is desirable for primers to be positively retained in position within a blasthole. Spiders, in the form of a sleeve having outwardly projecting legs, have been used for primer positioning. However, the spiders have generally been provided as separate articles which must be assembled with the primers at the blasthole or mine site. The packaging and transportation of these spiders is also inefficient due to their irregular shape.

We have now found an improved primer casing whereby the spider may be provided integrally with the casing and which casing is capable of more efficient packaging and transportation. According to the present invention there is provided a primer casing comprising a blasthole engagement means wherein said blasthole engagement means is moveable between a retracted position and a blasthole engagement position.

- 20 In one aspect there is provided a primer casing comprising a primer sleeve having a passage for receiving a primer and a blasthole engagement means having a primer engagement means such that the primer, when moved into a first position within the passage urges the blasthole engagement means outwards from the primer sleeve.
- 25 In a further aspect there is provided a primer casing comprising a primer sleeve having a passage for receiving a primer and at least one leg, said leg having a projection associated therewith which extends into the passage such that the primer, when moved into a first position within passage, urges the at least one leg outwards from the primer sleeve.
- 30 The primer casing of the present invention is preferably adapted to receive a primer and be inserted into a blasthole for the initiation of an explosive charge. The primer casing is

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desirably retained in position within the blasthole from the time of loading through to the initiation of the charge. This period may be from 1 hour to 30 days in duration. It is therefore desirable that the primer casing engage the walls of the blasthole so as to substantially retain the position of the primer within the blasthole.

5

Preferably the primer will be readily inserted into and retained within the primer casing. Whilst a variety of configurations will be apparent to the person skilled in the art, it is preferred that the primer be slidably inserted within a sleeve in the primer casing. The sleeve is preferably able to accommodate cardboard encased primers where the cardboard is swollen  
10 by water. The primer may preferably be retained within the sleeve by a retaining means such as a tab or the like.

In the retracted position, the blasthole engagement means are preferably held adjacent to or within the primer casing such that the primer casing is readily capable of being packed, stored  
15 and transported in an economic manner. The blasthole engagement means may be moved to a blasthole engagement position at the mine site or blasthole so as to permit advantage to be obtained from the ability to economically pack, store or transport the primer casings. Whilst the blasthole engagement means may be manually and separately moveable between the first retracted position and the blasthole engagement position, it is preferred that the provision of  
20 the primer within the primer casing also acts to move the blasthole engagement means from the retracted position to the blasthole engagement position. In one preferred aspect, it is the sliding of the primer into the primer sleeve which urges the blasthole engagement means outwards.

25 Preferably the blasthole engagement means is outwardly deployed by movement from the first position to the blasthole engaging position. The blasthole engagement means may be integral with the primer casing, such as having been formed from a single mould (eg. by injection moulding), or may be formed from separate parts moveable relative to each other. It is preferred that the blasthole engagement means is an integral component of the primer casing.

30

The blasthole engagement means may be of any convenient configuration, and preferably

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comprises at least one leg for engagement with the blasthole wall, more preferably the blasthole engagement means comprises at least three legs. The at least one leg preferably has a wall engagement portion which permits the legs to ride over the blasthole wall whilst the primer casing is being inserted into the blasthole but which legs act against the unintentional  
5 withdrawal of the primer casing of the blasthole. In a preferred configuration the wall engagement means comprise outwardly and rearwardly directed members.

Preferably the primer casing comprises a primer sleeve having a passage for receiving a primer. The passage for receiving a primer preferably allows the primer to be slidably  
10 inserted into the passage. Typically the passage will be cylindrical for receiving a cylindrical primer.

It is preferred that the primer incorporates a number of apertures in order that intimate contact may be established between the primer and the bulk explosive in the blasthole.

15

In a preferred embodiment, the blasthole engagement means comprises a projection which extends into the passage such that when the primer is moved to a blasthole engagement position within the passage. The blasthole engagement means are outwardly deployed. It is preferred that the insertion of the primer into a blasthole engaging position will outwardly  
20 deploy the legs by the camming of the projection or projections over the primer. The outwardly deployed legs preferably provide apertures in the primer casing which permits intimate contact of the bulk explosive with the primer.

The present invention accordingly provides a primer casing providing a primer sleeve having  
25 a passage for receiving a primer and at least one leg, said leg having a projection associated therewith which extends into the passage such that the primer, when moved to an activating position within the passage urges the at least one leg outwards from the primer sleeve to a blasthole engaging position.

30 The primer casing of the present invention may preferably comprise a retaining means for retaining the primer within the primer casing. In the preferred embodiment, the retaining

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means may be a tab, preferably an over centre (easily reversible) tab, which extends into the passage such that once the primer is positioned in the activating position it is retained in said position. Preferably the tab will act to prevent the hose directly engaging the primer and kinking the signal tube.

5

Preferably the primer casing comprises a leading portion which protects the primer from accidental impacts and minimises snagging on the walls of the blasthole whilst it is being inserted therein. Preferably the leading portion is in the form of a nose cone.

- 10 The primer casing may preferably further comprise a hose engaging means such as a sleeve, or extension of the sleeve for receiving the primer, adapted to engage the end of a hose used to fill the blasthole with explosive. Preferably the sleeve for engaging the end of the hose has an internal dimension slightly greater than the external dimension of the hose. The primer casing may be located onto the end of a hose for charging the blasthole and be positioned in  
15 the blasthole by the hose. The hose, when discharging the bulk explosive, preferably ejects the primer casing and fills the blasthole with the bulk explosive whilst being withdrawn from the blasthole.

- In a further aspect, the primer casing may be provided with connector means whereby a  
20 plurality of primer casings may be interconnected such that the leading primer casing which is positioned by the hose drags subsequent primer casings into the blasthole. The distance with which the primer casings are separated may be determined by the length of the interconnect between the primer casings. In a preferred configuration the connector means may be an aperture at either end of the primer casing such that the primer casings may be tied  
25 together with a length of signal tube, string, wire or the like.

The present invention further provides a method of loading a blasthole comprising the steps of:

- 30 1) in a primer having a primer casing comprising a blasthole engagement means, moving the blasthole engagement means from a first position to a blasthole engaging position:



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2) positioning the primer within a blasthole; and

3) loading said blasthole with a blasting charge.

5 The present invention further provides a method of loading a blasthole wherein a plurality of primers are positioned, spaced apart, in a blasthole wherein said plurality of primers are interconnected such that the positioning of the first primer will cause the subsequent primers to be positioned within said blasthole.

10 The present invention will now be further described with reference to the accompanying drawings. The drawings show primer casings which, when used with primers and initiating systems have been proven to initiate bulk explosives reliably. Figure 1 is a cut-away representation of the primer casing showing a primer prior to insertion therein. Figure 2 is a cut away representation of a primer casing having a primer inserted therein as well as the  
15 leading end of a loading hose. Figure 3 is a side view of a primer casing. Figure 4 is a cross section through A-A.

Figure 1 shows a primer casing (1) having four legs (2), of which three can be seen. Each of the legs (2) incorporates an inward projection (3) formed by a bend in the leg (2). The legs  
20 (4) are integrally formed with the primer casing (1) and extend into the gaps (4). The gaps (4) allow the legs (2) to be retained within the cylindrical shell (5) of the primer casing (1) for storage, transportation etc. The legs (2) are urged outwards, through the gaps (4) on insertion of the primer (11) into the primer casing (1). The primer (11) is retained within the cylindrical shell (5) of the primer casing (1) in a position in which the legs (2) are urged  
25 outwards by the camming of the inward protrusions (3) over the primer (11). The primer (11) is retained in this position by the over centre tabs (6) which may be depressed into a locking position as shown in figure 2. The cylindrical shell (5) extends to form a hose sleeve (7) the top of the primer casing (1) includes a nose cone (8) in which there is provided holes (9). The holes (9) may be used to interconnect a plurality of the primer casings in a spaced apart  
30 manner by tying together with a cord (not shown) or the like. In figure 1 the primer (11) is shown immediately prior to its insertion into the primer casing (1). Figure 2 shows the

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primer (11) inserted into the primer casing (1) such that the legs (2) are extended outwards for engagement with the wall of the blasthole. The primer (11) is retained in position within the primer casing (1) by the over centre tabs (6) the over centre tabs (6) are depressed into the retaining position once the primer (11) is in position. The over centre tabs (6) also act to prevent the explosives loading hose (13) from butting up against the primer (11) and deforming the initiating tube (12) which extends from the primer (11). Figure 4 shows the cross section through A-A, shown in figure 3 and details the construction of the over centre tabs. The over centre tabs (6) have three hinges, (6a, 6b and 6a). The outside hinges (6a) allow the over centre tab to depressed inwardly and the central hinge (6b) permits the over centre tab to deform and stably retain its locked position.

The primer casing of the present invention may advantageously confer a number of improvements in the primer casing over current configurations: These improvements include the positioning of a primer in a blasthole, engagement of primer with the hose, protection of primer from damage resulting from insertion into the blasthole, the primer casing has the ability to negotiate broken ground, and being able to multiple prime a blasthole of a series of interconnected primers.

Those skilled in the art will appreciate that the invention described herein is susceptible to variations and modifications other than those specifically described. It is to be understood that the invention includes all such variations and modifications which fall within its spirit and scope. The invention also includes all of the steps, features, compositions and compounds referred to or indicated in this specification, individually or collectively, and any and all combinations of any two or more of said steps or features.

Dated this 9 th Day of July, 1999

**Orica Australia Pty Ltd**

by DAVIES COLLISON CAVE  
Patent Attorneys for the Applicant

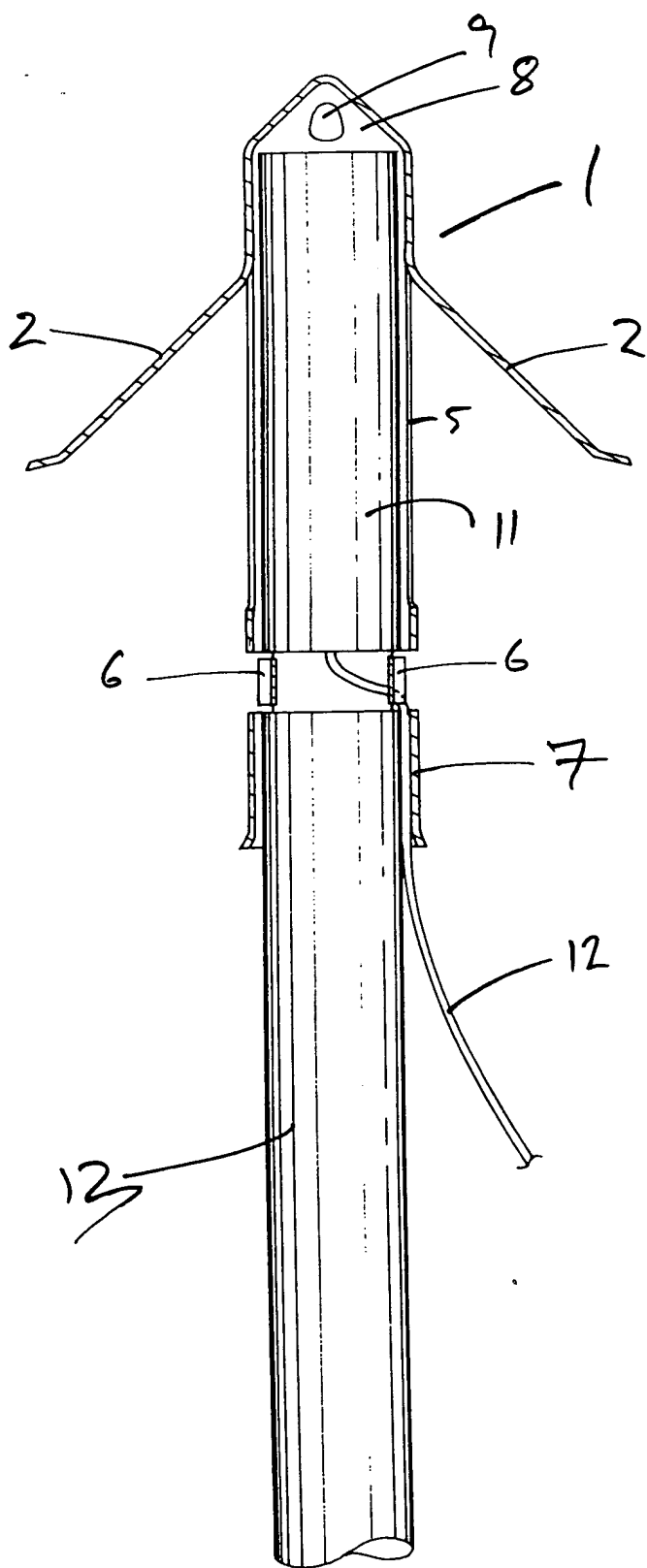


Figure 2

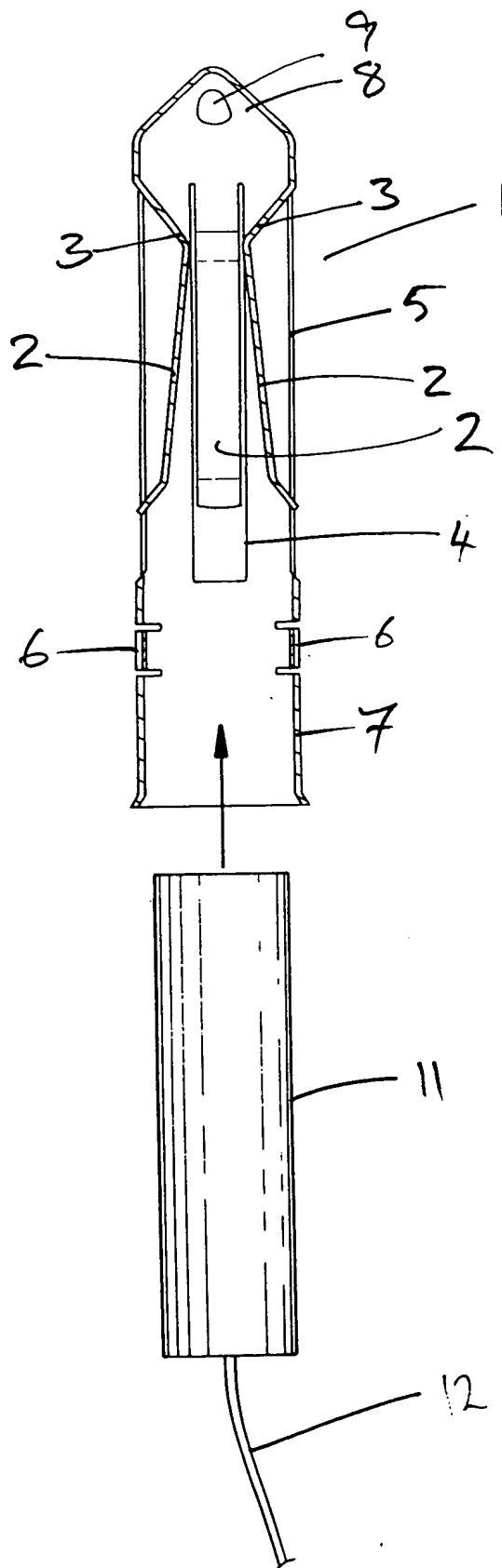


Figure 1

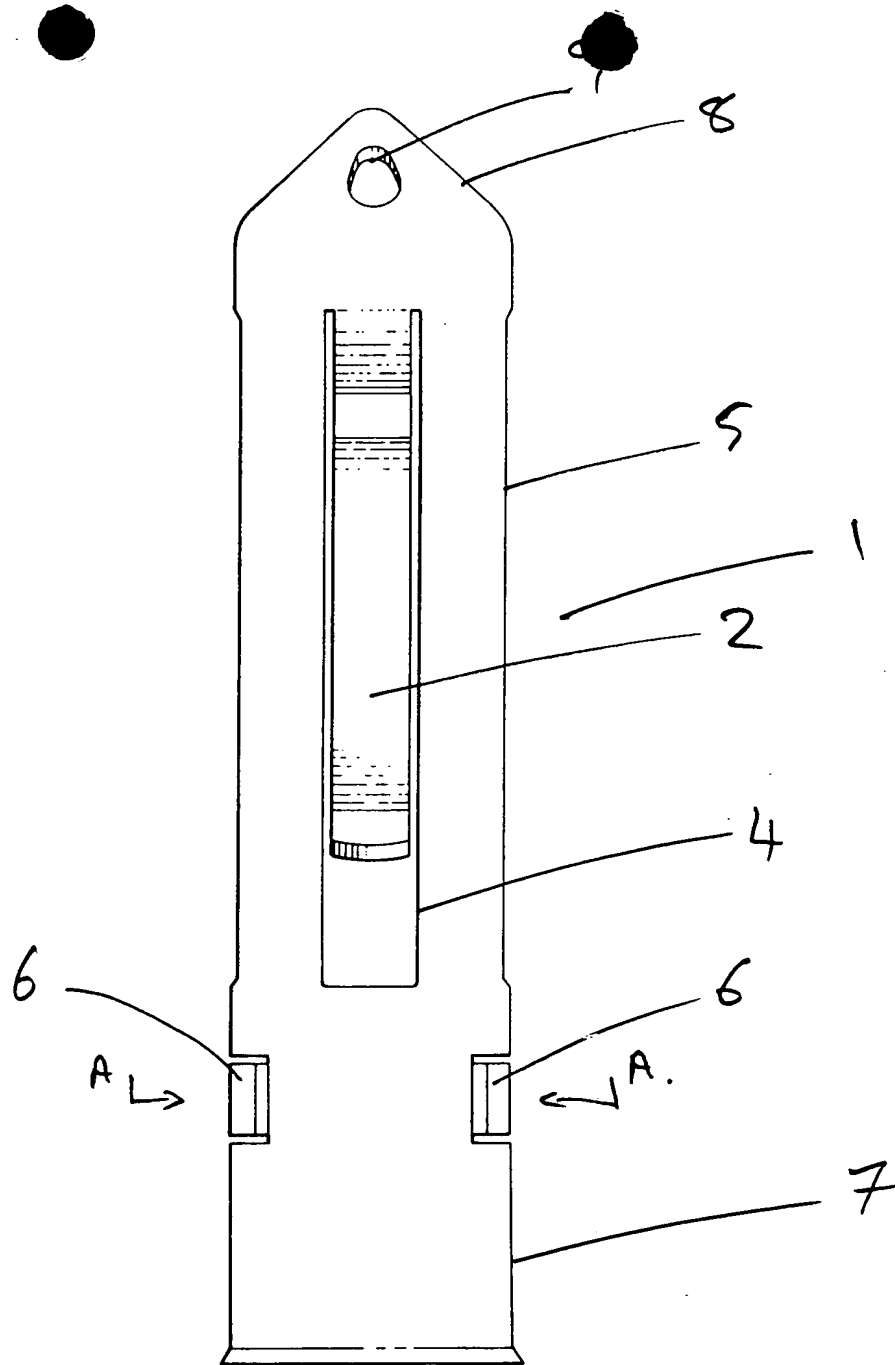


Figure 3

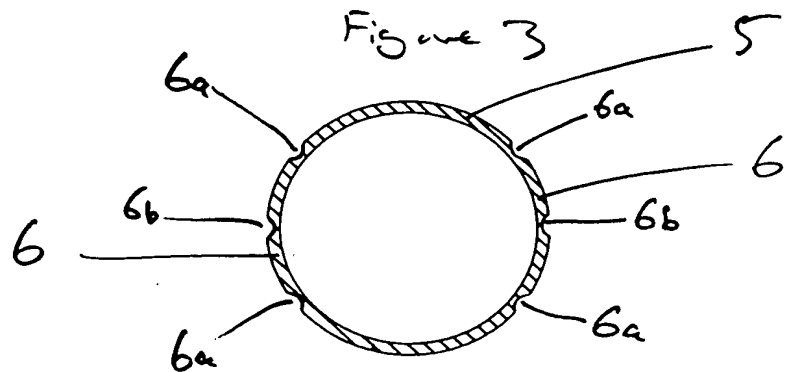


Figure 4